

Chapter ATCP 50

APPENDIX B

Nutrient Management Fast Facts (UWEX Publication)

CORN nutrient recommendations

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD					
Very Low	Low	Optimum	High	Very High	Ex High	Very Low	Low	Optimum	High	Very High	Ex High
..... LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					 LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					
Yield goal ton/A						Yield goal ton/A					
0-15.25	25	15	10	—	0	0-12.25	55	50	25	15	—
15.25-26	35	25	15	—	0	26.5-35	50	65	40	20	—
26-36	40	30	15	—	0	33.6-45	50	75	50	25	—
36-46	50	40	20	—	0	44.6-65	105	90	65	35	—
46-56	60	50	25	—	0	56.6-85	120	105	80	40	—
56-66	65	55	30	—	0	66.6-75	130	115	90	45	—
66-76	75	65	35	—	0	77.6-85	145	130	105	55	—
76-85	—	—	—	—	0	—	—	—	—	—	0

—Very low and very high category does not exist for soil test phosphorus. Use lower values on supply of organic acids.

ALFALFA nutrient recommendations

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD						
Very Low	Low	Optimum	High	Very High	Ex High	Very Low	Low	Optimum	High	Very High	Ex High	
..... LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					 LB (P.O.) OR (K.O.) / ACRE TO APPLY.....						
Yield goal ton/A						Yield goal ton/A						
0-15.25	90	45.75*	30	20	10	0	10.25	155	145	105	55	—
15.25-26	100	55.80*	40	30	15	0	26.5	230	220	160	90	45
26-36	115	70.95*	55	30	15	0	33.45	280	240	120	60	—
36-46	130	86.110*	70	35	20	0	44.55	350	340	300	150	75
46-56	145	100.125*	85	40	20	0	56.65	410	360	360	180	90
56-66	160	115.140*	100	50	25	0	66.65	470	460	210	105	—
66-76	170	125.150*	110	55	30	0	77.65	530	520	480	240	120
76-85	—	—	—	—	0	—	—	—	—	—	0	

—Very low and very high category does not exist for soil test phosphorus. Use lower values on supply of organic acids.

SOIL pH liming recommendations

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD					
Very Low	Low	Optimum	High	Very High	Ex High	Very Low	Low	Optimum	High	Very High	Ex High
..... LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					 LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					
Crop	Target pH					Previous Crop	LB N / ACRE (TOTAL TO APPLY)*				
Alfalfa	6.8					Highly high yield potential soils	0.05	0.10	0.15	0.20	
Corn, silage or grain	6.0					Com. Forage legumes, Legume vegetables, Green manures ¹	165*	135	120	105	
Pastures	6.0					Soybean; Small grains ²	135—140	120—135	100—115	90—105	
(grass or legume-grass)	6.3					Medium low yield potential soils	140	115	100	90	
Red Clover	6.3					Medium high yield potential soils	110—115	100—110	85—115	70—100	
Soybeans	6.3					Sand/damp sands	120	105	95	90	
Wheat	6.0					Irrigated—All crops ³	125	105	95	90	

*Use lower values on supply of organic acids.

LEGUME nitrogen credits

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD					
Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils	Medium fine textured sandy soils
..... LB N / ACRE TO CREDIT.....					 LB N / ACRE TO CREDIT.....					
FORAGE Alfalfa 1 st Year	> 8	< 8	< 8	< 8	< 8	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.
Alfalfa 1 st Year	Good	190	150	140	100	—	—	—	—	—	—
75-100% alfalfa, more than 1 plant/ ² ft ²	Fair	160	120	110	70	—	—	—	—	—	—
30-70% alfalfa, 1.5-4 plants/ ² ft ²	Poor	130	90	80	40	—	—	—	—	—	—
0-30% alfalfa, less than 1.5 plants/ ² ft ²	—	—	—	—	—	—	—	—	—	—	—

GREEN MANURE: 10% credit

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD					
Very Low	Low	Optimum	High	Very High	Ex High	Very Low	Low	Optimum	High	Very High	Ex High
..... LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					 LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					
Alfalfa, 60-100 Sweet Clover, 80-120 Red Clover, 50-80						Use 40 lb N acre credit if less than 6 inches of growth before tillage. Use upper end of range for spring seedings that are allowed under the following spring, use low end for fall seedlings.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.	In the second cropping year following a forage or grass stand on a fine/medium textured soil, take a 50 lb N acre credit.
Soybean, 40 Pea, Snap or Lima bean, 20						No credit on sandy soils. See credit applies to non-legume crops other than corn; soybean N for corn is accounted in Corn Nitrogen Guidelines.	—	—	—	—	—

FIELD CROPS IN WISCONSIN

SOIL TEST LEVEL OF THE FIELD						SOIL TEST LEVEL OF THE FIELD					
Very Low	Low	Optimum	High	Very High	Ex High	Very Low	Low	Optimum	High	Very High	Ex High
..... LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					 LB (P.O.) OR (K.O.) / ACRE TO APPLY.....					
Yield goal ton/A						Yield goal ton/A					
0-15.25	25	15	10	—	0	0-12.25	55	50	25	15	—
15.25-26	35	25	15	—	0	26.5-35	50	65	40	20	—
26-36	40	30	15	—	0	33.6-45	50	75	40	20	—
36-46	50	40	20	—	0	44.6-65	105	90	55	30	—
46-56	60	50	25	—	0	56.6-85	120	105	80	40	—
56-66	65	55	30	—	0	66.6-75	130	115	90	45	—
66-76	75	65	35	—	0	77.6-85	145	130	105	55	—
76-85	—	—	—	—	0	—	—	—	—	—	0

—Very low and very high category does not exist for soil test phosphorus. Use lower values on supply of organic acids.

LEGGUMES

Additional Guidelines:

- For max. stage yield, use rate for 0.05 price ratio. To adjust rates for a higher price ratio, use price ratio that reflects typical price for N and grain.
- If >50% residue at planting, use upper end of range.
- If all N is from organic sources, use top end of range. Plus, up to 20 lb N acre as starter may be used.
- For medium & fine-textured soils with >10% soil organic matter, use low end of range; <25 OM, use high end of range.
- For coarse-textured, medium field potential soils with <2% OM, use high end of range; >25 OM, use mid to low end of range.
- When corn follows small grains on medium & fine-textured soils, use the mid to low end of range.
- For irrigated, medium field potential soils, use rate for high yield potential soils.
- If fertilizer for every year (residual) N, use low end of range or use the high end and subtract peatland soil nitrate loss (PNL) credits.

N-Corn Price Ratios

Price of N \$/lb N	Price of Corn (\$/bu corn)
1.80	2.20
2.44	2.40
2.66	2.60
2.88	2.80
3.10	3.10
3.44	3.40
3.66	3.60
3.88	3.80
4.00	4.20
4.44	4.24

*Price of N = [Non-fertilizer x (100 % in fertilizer)]/2000

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This publication is available from the Nutrient and Pest Management Program. For more copies, please contact us at: Attn: (UW-Madison) ext. 6308, phone (608) 255-2660, website (http://wiscerts.uwex.edu).

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WISCONSIN ADMINISTRATIVE CODE

MANURE information

Nutrient Management

APPROX. AVAILABLE NUTRIENT CONTENT
1st YEAR [2nd Year]

N	N*	P ₂ O ₅	K ₂ O
Dairy Solid (lb/ton)	3 [1]	4 [1]	5 [1]
Liquid (lb/1000 gal)	7 [2]	10 [2]	5 [1]
Beef Solid (lb/ton)	4 [1]	5 [1]	5 [1]
Liquid (lb/1000 gal)	6 [2]	7 [2]	5 [1]
Swine Solid (lb/ton)	7 [1]	9 [2]	6 [1]
Liquid (lb/1000 gal)	33 [5]	25 [4]	24 [3]
Indoor Pit	26 [5]	33 [5]	10 [1]
Outdoor Pit	17 [3]	22 [4]	16 [2]
Farrowing nursery	13 [2]	16 [3]	14 [2]
Indoor Pit	18 [2]	18 [2]	18 [2]
Poultry Solid (lb/ton)	20 [4]	24 [4]	30* [5]
Liquid (lb/1000 gal)	8 [2]	10 [1]	6 [1]
Horse Solid (lb/ton)	3 [1]	4 [1]	4 [0]
			8 [1]

* Manure incorporated within 3 days
* 24 for turkey

MANURE OUTPUT*

Animal	weight	lbd/yr	ton/yr	g/day	1000 gal/yr
Dairy	1400lb	148	27	17.7	6.5
Beef	1100lb	80	15	9.5	3.5
Swine	150lb	9.5	1.7	1.2	0.44
Chicken Broiler	2 lb	0.18	0.031	0.02	0.008
Horse	1000lb	50	9.1	6.0	2.2

*Volume as a conversion

DETERMINING MANURE APPLICATION RATE

Step 1: Figure load size:
$$\frac{\text{field length (ft)} \times \text{field width (ft)}}{43,560 \text{ ft}^2/\text{acre}} = \text{acres}$$
Weigh spreader in tons for solid or semi-solid manure
Use 90% tank capacity in gallons for liquid manureStep 2: Determine field acreage:
$$\frac{\text{field length (ft)} \times \text{field width (ft)}}{43,560 \text{ ft}^2/\text{acre}} = \text{acres}$$
Step 3: Calculate manure application rate:
$$\frac{[\# \text{ of loads} \times (\text{load size})]}{\text{field acreage}} = \text{tons or gallons / acre}$$
Example with corn harvested by combine:
Step 1: 12,580 lbs x (1 - 21.35% moisture) = 9,473.2 lbs / 43,560 ft²/acre = 0.216 acres
Step 2: 12,580 lbs x (1 - 20% moisture) = 9,640 lbs / 43,560 ft²/acre = 0.221 acres
Step 3: 12,580 lbs / 43,560 ft²/acre = 0.288 acres

CALCULATING ACRES HARVESTED:

$$\text{acres harvested} = \frac{[\text{row length (ft)} \times \text{row width (ft)} \times \# \text{ of rows harvested}]}{43,560 \text{ ft}^2/\text{acre}}$$
Example with corn harvested by combine:
Step 1: 12,580 lbs x (1 - 21.35% moisture) = 9,473.2 lbs / 43,560 ft²/acre = 0.216 acres
Step 2: 12,580 lbs x (1 - 20% moisture) = 9,640 lbs / 43,560 ft²/acre = 0.221 acres
Step 3: 12,580 lbs / 43,560 ft²/acre = 0.288 acres

PLANTING & HARVEST information

FERTILIZER ANALYSIS

DETERMINING PLANT POPULATIONS

Row Width 20" 28" 30" 32" 36" 38" 40"
Row Length* 261" 188" 175" 164" 146" 139" 131"

*Row length required to equal 1/1000 acre

Calculation: (# of plants in row length) x 1000 = plants/acre

NUTRIENTS REMOVED BY CROP AT HARVEST

	P ₂ O ₅	K ₂ O
Alfalfa / Red Clover, per ton (dry matter)	13	60
Barley	0.40	0.35
Grain per bu = 48 lb @ 14.5% moisture)	10	32
Straw, per ton (dry matter)	0.38	0.29
Grain per bu = 56 lb @ 15.6% moisture)	11	44
Straw, per ton (55% moisture)	3.6	8.3
Sweet, per ton (fresh)	3.3	6.0
Oatlage, per ton (dry matter)	0.29	0.19
Oats	0.47	0.47
Grain, per bu = 32 lb @ 14.4% moisture)	13	50
Straw, per ton (dry matter)	0.12	0.50
Potatoe, per ton (fresh)	0.41	0.31
Rye	0.40	0.40
Grain per bu = 56 lb @ 14% moisture)	15	60
Straw, per ton (dry matter)	0.40	0.40
Sorghum, Grain, per bu = 56 lb @ 14% moisture)	16	60
Sorghum-Sudan, Forage, per ton (65% moisture)	0.80	1.4
Grain, per bu = 60 lb @ 13% moisture)	17	64
Straw, per ton (dry matter)	0.80	1.9
Soybean*	0.50	0.35
Grain, per bu = 60 lb @ 13% moisture)	18	68
Straw, per ton (dry matter)	0.50	0.28

Liquid weights:
1 gallon water weighs 8.3 lbs
1 gallon UAN (28%) weighs 10.6 lbs
1 gallon 10-54-0 weighs 11.6 lbs
1 gallon 6-18-9 weighs 11.1 lbs

CONVERSIONS

to get column 3
multiply by column 2

	square feet (ft ²)	hectare (ha)	acres (a)	cubic feet (ft ³)	gallons (gal)	cubic feet (ft ³)	gallons - dry	milliliters (ml)	liters (l)	fluid ounces (fl oz)	feet (ft)	ton (short)	ton (long)	gallons/acre (gal/ha)	miles/hour (mph)	pounds/acre (lb/ha)	kilograms/hectare (kg/ha)
acre (a)	43,560	0.405	1.244	7,488	640	8	9.31	66	3.78	5280	2,000	2,250	9,354	1,112	0.44	P (lb)	
acre (a)	43,560	0.405	1.244	7,488	640	8	9.31	66	3.78	5280	2,000	2,250	9,354	1,112	0.44	K (lb)	
square mile (mi ²)	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
cubic yard (yd ³)																	
cubic feet (ft ³)																	
bushel (bu)																	
bushel (bu)																	
bushel (bu)																	
bushel (bu)																	
acres-foot																	
gallon (gal)																	
chain (ch)																	
rod (r)																	
mile (mi)																	
ton (short)																	
ton (long)																	

To get column 1, divide column 3 by column 2

MANURE information

FAST FACTS

indicates information pertains to Wisconsin only

CONVERTING POUNDS HARVESTED TO BUSHEL WITH 0% MOISTURE CONTENT CORRECTIONS	
Shelled Corn	
[(#. harvested x (1 - % moisture in corn)) + 47.32] = bu @ 15.5% moisture	
Ear corn	
[(#. harvested x (1 - % moisture in corn)) + 47.32] = bu @ 15.5% moisture	
Soybeans or wheat	
[(#. harvested lbs x (1 - % moisture)) + 52.2] = adjusted lbs harvested	
[(adjusted lbs x (1 - % moisture)) + 52.2] = bu @ 0% moisture	
bu @ 0% moisture	
CALCULATING ACRES HARVESTED:	
acres harvested = [(row length(ft) x row width(ft) x # of rows harvested) + 43,560 ft ² /acre]	